QUIZZES

Practice test 2 Unit 10

10 Questions

7 min

Topics

Photon

Start Quiz

06 : 59

Q 1/10 7 min Hint

Q : The frequency of light beam A is twice that of light beam B. The ratio E_A/E_B of photon energies is

A 1

B 4

C 1/2

D 2

06 : 56

Q 2/10 7 min Hint

Q : Which one of the following radiations has the strongest photon?

A T.V waves

B Micro waves

C X-rays

D Y-rays

06 : 54

Q 3/10 7 min Hint

Q : The curve drawn between velocity and frequency of photon in vacuum will be a:

A straight line parallel to velocity axis

B hyperbola

C straight line passing through origin and making an angle of 45° with frequency axis

D straight line parallel to frequency axis

06 : 52

Q 4/10 7 min Hint

Q : The speed of photon :

A May be greater than speed of light

B Must be equal to speed of light

C May be less than speed of light

D Must be less than speed of light

06 : 50

Q 5/10 7 min Hint

Q : A radio station emits 10 kW power of 90.8 MHz. Find the number of photon emitted per second

A 1.6×10^{28}

B 1.6×10^{29}

C 1.6×10^{30}

D 1.6×10^{32}

06 : 48

Q 6/10 7 min Hint

Q : A photon is _____

A a unit of energy

B a positively charged particle

C a quantum of electromagnetic radiation

D a unit of wavelength

06 : 45

Q 7/10 7 min Hint

Q : If n number of photon are striking on a metal surface, then total momentum exerted is _____

A nh/λ

B $2nh/\lambda$

C zero

D n f×t

06 : 43

Q 8/10 7 min Hint

Q : The momentum of a photon is 3.3×10^{-29} kg-m/sec. Its frequency will be

A 7.5×10^{12} Hz

B 6×10^{3} Hz

C 3×10^{3} Hz

D 1.5×10^{13} Hz.

06 : 41

Q 9/10 7 min Hint

Q : The momentum of a photon is 2×10^{-16}gm-cm/sec. Its energy is

A 6×10^{-8}erg.

B 6×10^{-6}erg

C 2.0×10^{-26}erg

D 0.61×10^{-26}erg

Q : An AIR station is broadcasting the waves of wavelength 300 metres. If the radiating power of the transmitter is 10 kW, then the number of photons radiated per second is

- 1.5×10^{29}
- 1.5×10^{33}.
- 1.5×10^{31}
- 1.5×10^{35}

QUIZ RESULT

Practice test 2 Unit 10

0/10

0%

Incorrect

1/10

Q : The frequency of light beam A is twice that of light beam B. The ratio E_A/E_B of photon energies is

1

4

1/2

2

Explanation

$$E \propto f \rightarrow \frac{E_A}{E_B} = \frac{f_A}{f_B} = \frac{2f_B}{f_B}$$

$$\frac{E_A}{E_B} = 2$$

Incorrect

2/10

Q : Which one of the following radiations has the strongest photon?

TV waves

Micro waves

X-rays

γ-rays

Explanation

Energy of γ rays is the largest E = hf

Incorrect 3/10

Q : The curve drawn between velocity and frequency of photon in vacuum will be a:

straight line parallel to velocity axis

hyperbola

straight line passing through origin and making an angle of 45° with frequency axis

straight line parallel to frequency axis

Explanation

Information

Incorrect 4/10

Q : The speed of photon :

A. May be greater than speed of light

B. Must be equal to speed of light

C. May be less than speed of light

D. Must be less than speed of light

Explanation

Information

Correct | Unattempted

Incorrect | 5/10

Q : A radio station emits 10 kW power of 90.8 MHz. Find the number of photon emitted per second

1.6×10^{28}

1.6×10^{29}

1.6×10^{30}

1.6×10^{32}

Explanation

$$P = \frac{E}{t} = \frac{nhf}{t} \Rightarrow \frac{n}{t} = \frac{P}{hf}$$

$$\frac{n}{t} = \frac{10 \times 10^{3}}{6.63 \times 10^{-34} \times 90.8 \times 10^{6}}$$

$n = 1.6 \times 10^{29}$ photons per second

Correct : Unattempted

Incorrect 6/10

Q : A photon is _____

a unit of energy

a posit vely charged particle

a quantum of electromagnetic radiation

a unit of wavelength

Explanation

Photon is energy packet of energy which are ntegral part of all electromagnetic radiations which cannot be subdivided according to Einstein.

Incorrect

7/10

Q : If n number of photon are striking on a metal surface, then total momentum exerted is _____

A nh/λ

B 2nh/λ

C zero

D n fxt

Explanation

As, $\frac{h}{\lambda}$ for 1 photon

$\therefore p = \frac{nh}{\lambda}$ for n photon

Correct   Not attempted

Incorrect   MR

Q : The momentum of a photon is 3.3×10^{-29} kg-m/sec. Its frequency will be

- 7.5×10^{12} Hz
- 6×10^{3} Hz
- 3×10^{3} Hz
- 1.5×10^{13} Hz.

Explanation

$$p = \frac{h}{\lambda} = \frac{h}{\frac{v}{f}} = \frac{hf}{v}$$

$$f = \frac{pv}{h} = \frac{(3.3\times10^{-29})(3\times10^{8})}{(6.64\times10^{-34})}$$

$f = 1.5\times10^{13}$ Hz

Incorrect

9/10

Q : The momentum of a photon is 2×10^{-16}gm-cm/sec. Its energy is

6×10^{-8}erg.

6×10^{-6}erg

2.0×10^{-26}erg

0.61×10^{-26}erg

Explanation

$$p = \frac{E}{c} \Rightarrow E = p \cdot c = 2\times10^{-16} \cdot 3\cdot10^{10}$$

Incorrect

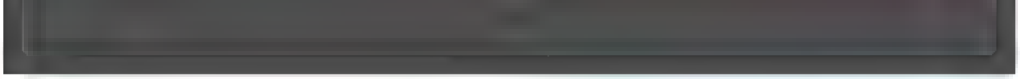
10/10

Q : An AIR station is broadcasting the waves of wavelength 300 metres. If the radiating power of the transmitter is 10 kW, then the number of photons radiated per second is

- 1.5×10^{29}
- 1.5×10^{33}.
- 1.5×10^{31}
- 1.5×10^{35}

Explanation

$$P = \frac{W}{t} = \frac{nhc}{\lambda t} = \frac{n}{t} = \frac{P\lambda}{hc} = \frac{10 \times 10^3 \times 300}{6.6 \times 10^{-34} \times 3 \times 10^8}$$



Q : Louise de-Broglie wavelength of a particle can be expressed by:

A $\lambda = \frac{P}{h}$

B $\lambda = \frac{h}{P}$

C $\lambda = \frac{h}{mc}$

D none of these

Q : Interference and diffraction of light confirm its

A particle nature of light

B wave nature of light

C dual nature of light

D electromagnetic nature of light

Q : A body of mass 200 g moves at the speed of 5 m/hr. So de Broglie wavelength related to it is of the order ($h=6.26 \times 10^{-34}$ Js)

- 10^{-10}m
- 10^{-30} m
- 10^{-20} m
- 10^{-40} m

Q :

X rays are similar in nature to _____

- Cathode rays
- Positive rays
- Gamma- rays
- α- rays

Q : According to De-Broglie, an electron can be regarded as:

- particle only
- are negligible
- particle and wave both
- none of these

Q : What is the de Broglie wavelength of a proton whose linear momentum has a magnitude of 3.3×10^{-23} kg · m/s?

- 0.0002 nm
- 0.002 nm
- 0.02 nm
- 0.2 nm

Q : The velocity of a particle of mass m of de-Broglie wavelength λ is _____

- $\frac{2h}{m\lambda}$
- $\frac{m_0c^2}{n}$
- $2m_0c^2$
- $h/m\lambda$

Q : A body of mass 200 g moves at the speed of 5 m/hr. So de Broglie wavelength related to it is of the order ($h=6.26 \times 10^{-34}$ Js)

- 10^{-10}m
- 10^{-30} m
- 10^{-20} m
- 10^{-40} m

Q : A proton, an electron and a uranium nucleus all have the same wavelength. The one with the most energy

- is the electron
- is the proton
- is the uranium nucleus
- depends upon the wavelength and the properties of the particle.

Q : **The magnitude of de-Broglie wavelength λ of electrons (e) proton (p) neutron n and α particles, all have the same energy 1 MeV, in increasing order will follow the sequence.**

QUIZ RESULT

Practice test 3 Unit 10

0/10

0%

Q : Louise de-Broglie wavelength of a particle can be expressed by:

- $\lambda = \frac{P}{h}$
- $\lambda = \frac{h}{P}$
- $\lambda = \frac{h}{mc}$
- none of these

Explanation

$E = mc^2$

$hf = mc \cdot c$

$hf = Pc$

$\frac{hc}{\lambda} = Pc$

$\lambda = \frac{h}{P}$

incorrect

2/10

Q : Interference and diffraction of light confirm its

particle nature of light

wave nature of light

dual nature of light

electromagnetic nature of light

Explanation

It is properties of wave.

Q : A body of mass 200 g moves at the speed of 5 m/hr. So de-Broglie wavelength related to it is of the order (h=6.26 x 10^{-34} Js)

- 10^{-10}m
- 10^{-30} m
- 10^{-20} m
- 10^{-40} m

Explanation

$m = 200\,g = 0.2\,kg,\ v = 5\ \frac{m}{hr} = \frac{5}{3600}$

$\lambda = \frac{h}{mv}$

$\therefore \lambda = \frac{h}{mv} = \frac{6.626 \times 10^{-34} \times 3600}{0.2 \times 5}$

$= 23.85 \times 10^{-30}$

$= 2.385 \times 10^{-30}$

$= 10^{-30} m$

Incorrect 4/10

Q :

X rays are similar in nature to _____

- Cathode rays
- Positive rays
- Gamma- rays
- α- rays

Explanation

Both X-Rays & Gamma-rays are electromagnetic.

Incorrect 5/10

Q : According to De Broglie, an electron can be regarded as:

- particle only
- are negligible
- particle and wave both
- none of these

Explanation

$\lambda = \frac{h}{p}$

De-Broglie assumed that electron can be regarded as particle and as a wel. Davisson and Germer proved the wave nature of electron.

Incorrect

6/10

Q : What is the de Broglie wavelength of a proton whose linear momentum has a magnitude of 3 3 × 10^{-23} kg • m/s?

0.0002 nm

0.002 nm

0.02 nm

0.2 nm

Explanation

$= 2 \cdot 10^{-11}\,m = 2 \cdot 10^{-2} \cdot 10^{-9}\,m$

$= 0.02\,nm$

←

Incorrect

7/10

Q : The velocity of a particle of mass m of de Broglie wavelength λ is _____

A $\frac{2h}{m\lambda}$

B $\frac{m\lambda c^2}{h}$

C $2m\lambda c^2$

D $h/m\lambda$

Explanation

$\lambda = \frac{h}{mv} \rightarrow v = \frac{h}{m\lambda}$

Q : A body of mass 200 g moves at the speed of 5 m/hr. So de-Broglie wavelength related to it is of the order ($h=6.26 \times 10^{-34}$ Js)

- 10^{-10}m
- 10^{-30} m
- 10^{-20} m
- 10^{-40} m

Explanation

$m = 200\ g = 0.2\ kg, v = 5\ \frac{m}{hr} = \frac{5}{3600}\ \frac{m}{s}$

$p = \frac{h}{\lambda} = mv$

$\therefore \lambda = \frac{h}{mv} = \frac{6.626 \times 10^{-34} \times 3600}{0.2 \times 5}$

$= 23.85 \times 10^{-32}$

$= 2.385 \times 10^{-31}$

$= 10^{-30}$m

Q · A proton, an electron and a uranium nucleus all have the same wavelength. The one with the most energy

- is the electron
- is the proton
- is the uranium nucleus
- depends upon the wavelength and the properties of the particle.

Explanation

$\lambda = \frac{h}{mv} = \frac{h}{\sqrt{2mE}} \Rightarrow E = \frac{h^2}{2m\lambda^2}$ ∴ λ is same for all, so $E \propto \frac{1}{m}$ Hence energy will be maximum for particle with lecher mass

Incorrect

10/10

Q : **The magnitude of de-Broglie wavelength of electrons (e) proton (p) neutron n and α particles, all have the same energy 1 MeV, in increasing order will follow the sequence.**

Explanation

$\lambda = \frac{h}{\sqrt{2mE_k}} \propto \frac{1}{\sqrt{m}}$ for same kinetic energy

Q : What is the momentum of a photon having frequency $1.5 \times 10^{13} Hz$?

- $3.3 \times 10^{-29} kg - m/s$
- $6.6 \cdot 10^{-34} kg - m/s$
- $3.3 \cdot 10^{-34} kg - m/s$
- $6.6 \times 10^{-30} kg - m/s$

Q : A body of mass 200 g moves at the speed of 5 m/hr. So de Broglie wavelength related to it is of the order ($h=6.26 \times 10^{-34}$ Js)

- 10^{-10}m
- 10^{-30} m
- 10^{-20} m
- 10^{-40} m

Q : If an electron is accelerated through a potential difference of 54 volts, its de Broglie wavelength will be·

- 1.66×10^{-8}m
- 1.66×10^{9}m
- 1.66×10^{-10}m
- 1.66×10^{-12}m

Q : What is the de Broglie wavelength of a proton whose linear momentum has a magnitude of 3.3×10^{-23} kg · m/s?

- 0.0002 nm
- 0.002 nm
- 0.02 nm
- 0.2 nm

Q : The electron, accelerated by a potential difference V has de-Broglie wavelength λ. If the electron is accelerated by a p.d 4V, its de-Broglie wavelength will be

- 2λ
- 4λ
- $\frac{\lambda}{2}$
- $\frac{\lambda}{4}$

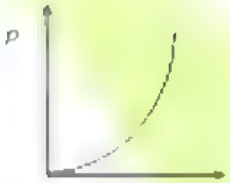
Q : The wavelength of matter waves is independent of:

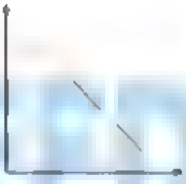
- Mass
- Velocity
- Momentum
- Charge

Q : Ratio of momentum of photons having wavelength 4000 angstrom and 8000 angstrom is

- 2 : 1
- 1 : 2
- 20 : 1
- 1 : 20

Q : Which of the following figure represents the variation of particle momentum and the associated de-Broglie wavelength





Q : A proton, an electron and a uranium nucleus all have the same wavelength. The one with the most energy

- is the electron
- is the proton
- is the uranium nucleus
- depends upon the wavelength and the properties of the particle.

Q : A proton and α particle are accelerated through the same kinetic energy. The ratio of their de-Broglie wavelength $\lambda_p / \lambda_\alpha$.

- 1:1
- $\sqrt{2}$ 1
- 2 1
- 4 1

QUIZ RESULT

Practice test 4. Unit 10

0/10

0%

Incorrect

1/10

Q : What is the momentum of a photon having frequency $1.5 \cdot 10^{13}$ Hz?

3.3×10^{-29} kg – m / s

$6.6 \cdot 10^{-34}$ kg – m / s

$3.3 \cdot 10^{-34}$ kg – m / s

$6.6 \cdot 10^{-30}$ kg – m / s

Explanation

Momentum = (Energy/c)

$\therefore p = \frac{[illegible] \cdot 1.5 \cdot 10^{13}}{3 \cdot 10^{8}} = 3.$

Q : A body of mass 200 g moves at the speed of 5 m/hr. So de-Broglie wavelength related to it is of the order (h=6.26 x 10^{-34} Js)

- 10^{-10}m
- 10^{-30} m
- 10^{-20} m
- 10^{-40} m

Explanation

$m = 200\,g = 0.2\,kg, \quad v = 5\ \frac{m}{hr} = \frac{5}{3600}$

$\lambda = \frac{h}{p} = \frac{h}{mv}$

$= \frac{6.62 \times 10^{-34} \times 3600}{0.2 \times 5}$

$= 23.85 \times 10^{-31}$

$= 2.385 \times 10^{-30}$

$= 10^{-30} m$

Q : If an electron is accelerated through a potential difference of 54 volts, its de-Broglie wavelength will be:

- 1.66×10^{-8}m
- 1.66×10^{-9}m
- 1.66×10^{-10}m
- 1.66×10^{-12}m

Explanation

$$\lambda = \frac{h}{\sqrt{2mVe}}$$

$$\lambda = \frac{6.63 \times 10^{-34}}{\sqrt{2 \times 9.1 \times 10^{-31} \times 54 \times 1.6 \times 10^{-19}}}$$

$$\lambda = 1.66 \times 10^{-10} m$$

Correct

4/5

Q : What is the de Broglie wavelength of a proton whose linear momentum has a magnitude of 3.3×10^{-23} kg • m/s?

0.0002 nm

0.002 nm

0.02 nm

0.2 nm

Explanation

$$\lambda = \frac{h}{p} = \frac{6.6 \times 10^{-34}}{3.3 \times 10^{-23}}$$

$$\lambda = 2 \times 10^{-11}\ m = 2 \times 10^{-2} \times 10^{-9}\ m$$

$$= 0.02\ nm$$

← Pr

Correct

Unattempted

Incorrect

5/10

Q : The electron, accelerated by a potential difference V has de-Broglie wavelength λ. If the electron is accelerated by a p.d 4V, its de-Broglie wavelength will be

2λ

4λ

$\frac{\lambda}{2}$

$\frac{\lambda}{4}$

Explanation

$$\lambda = \frac{h}{\sqrt{2meV}} \rightarrow \lambda \propto \frac{1}{\sqrt{V}}$$

Incorrect

6/10

Q : The wavelength of matter waves is independent of:

- Mass
- Velocity
- Momentum
- Charge

Explanation

According to $\lambda = \frac{h}{mv}$, wavelength is independent of charge.

Incorrect

7/10

Q : Ratio of momentum of photons having wavelength 4000 angstrom and 8000 angstrom is

2 : 1

1 . 2

20 : 1

1 : 20

Explanation

$$P = \frac{h}{\lambda} \quad \therefore P \propto \frac{1}{\lambda}$$

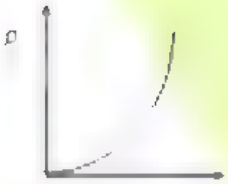
$$\therefore \frac{P_1}{P_2} = \frac{\lambda_2}{\lambda_1} = \frac{8000}{4000} = \frac{2}{1}$$

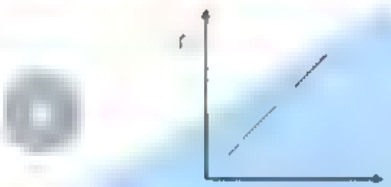
$$\therefore \frac{P_1}{P_2} = 2 : 1$$

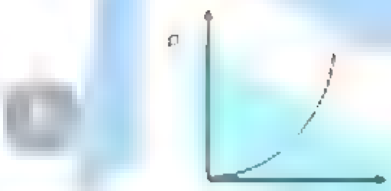
Incorrect

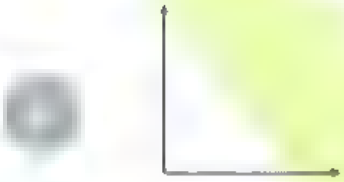
8/10

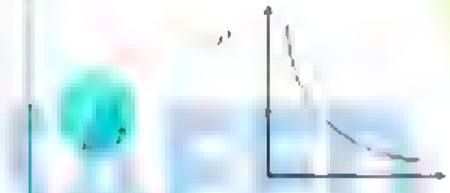
Q : Which of the following figure represents the variation of particle momentum and the associated de-Broglie wavelength











Explanation

De-Brogile wavelength $\lambda = \frac{h}{p} \Rightarrow \lambda \propto \frac{1}{p}$

i.e graph will be a rectangular hyperbola

Q : A proton, an electron and a uranium nucleus all have the same wavelength. The one with the most energy

- is the electron
- is the proton
- is the uranium nucleus
- depends upon the wavelength and the properties of the particle

Explanation

$\lambda = \frac{h}{mv} = \frac{h}{\sqrt{2mE}} \Rightarrow E = \frac{h^2}{2m\lambda^2}$ $\therefore \lambda$ is same for all, so $E \propto \frac{1}{m}$ Hence energy will be maximum for particle with lecher mass

←

Incorrect

10/10

Q : A proton and α particle are accelerated through the same kinetic energy. The ratio of their de-Broglie wavelength 'λ_p' : 'λ_α'.

1:1

$\sqrt{2}$ 1

2 1

4 1

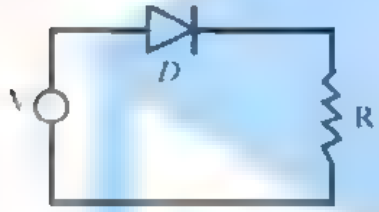
Explanation

$$\lambda = \frac{h}{\sqrt{m_p E_k}} \quad \frac{\lambda_p}{\lambda_\alpha} = \frac{\frac{1}{\sqrt{m}}}{\frac{1}{\sqrt{4m_p}}} = \frac{\sqrt{4m_p}}{\sqrt{m_p}}$$

Q : If a full wave rectifier circuit is operating from 50 Hz mains, the fundamental frequency in the ripple will be

- 25 Hz
- 50 Hz
- 70.7 Hz
- 100 Hz

Q : A pn junction (D) shown in the figure can act as a rectifier. An alternating current source (V) is connected in the circuit. The output current in the circuit is represented by:



Q : In full wave rectification by bridge the number of diodes requ red are

- 3
- 5
- 2
- 4

Q : The process in which A.C is converted into D.C is

- amplification
- sterilization
- rectification
- magnification

Q : The output voltage of a rectifier is

- smooth
- pulsating
- straight
- parabolic

Q :

In a semiconductor diode, the barrier offers opposition to only

- Majority carries in both regions
- Minority carries in both regions
- B, C
- Holes in the p-regions

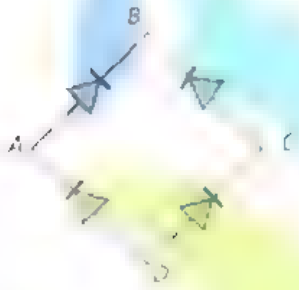
Q :

Select the correct statement

- In a fu l wave rectifier, two diodes work alternately
- In a full wave rectifier, two diodes work simultaneously
- The efficiency of full wave and half wave rectifiers is same
- The full wave rectifier is bi-directional.

Q :

In the diagram, the input is across the terminals A and C and the output is across the terminals B and D, then the output is



Zero

Same as input

Full wave rectifier

Half wave rectifier

Q :

In the depletion region of an unbiased P-N junction diode there are

- Only electrons
- Only holes
- Both electrons and holes
- Only fixed ions

Q :

Which is the correct diagram of a half-wave rectifier

QUIZ RESULT

Practice test 4 Unit 10

0/10

0%

Correct

Unattempted

Incorrect

1/10

Q : If a full wave rectifier circuit is operating from 50 Hz mains, the fundamental frequency in the ripple will be

25 Hz

50 Hz

70.7 Hz

100 Hz

Explanation

In a full wave rectifier, the fundamental frequency in ripple is twice of input frequency.

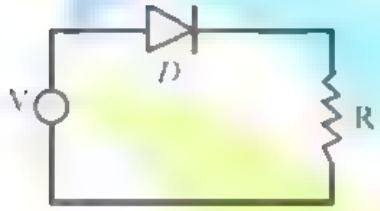
:orrect

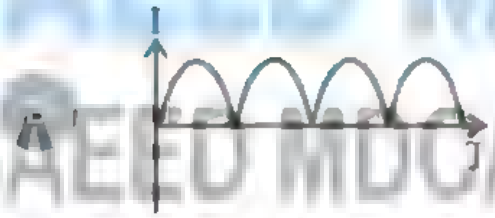
Unattempted

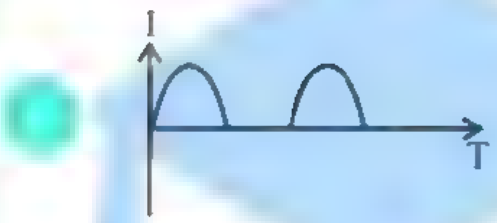
:correct

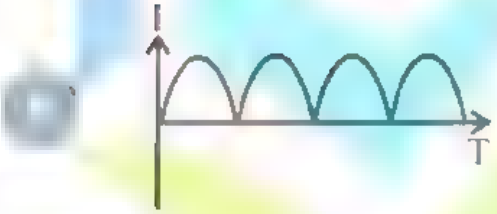
2/10

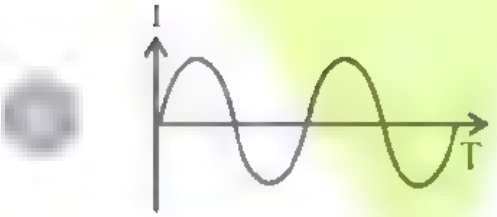
Q : A pn junction (D) shown in the figure can act as a rectifier. An alternating current source (V) is connected in the circuit. The output current in the circuit is represented by:

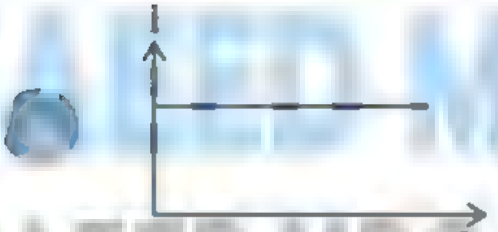












Explanation

the given circuit is for half wave rectification

Incorrect

3/10

Q : In full wave rectification by bridge the number of diodes requ red are

3

5

2

4

Explanation

In full wave rectification bridge circuit requires 4 diodes.

Incorrect

4/10

Q : The process in which A.C is converted into D.C is

amplification

sterilization

rectification

magnification

Explanation

Definition of rectification

Incorrect

5/10

Q : The output voltage of a rectifier is

smooth

pulsating

straight

parabolic

Explanation

Book line

Incorrect

6/10

Q :

In a semiconductor diode, the barrier offers opposition to only

- Majority carries in both regions
- Minority carries in both regions
- B, C
- Holes in the p-regions

Incorrect

7/10

Q :

Select the correct statement

In a full wave rectifier, two diodes work alternately

In a full wave rectifier, two diodes work simultaneously

The efficiency of full wave and half wave rectifiers is same

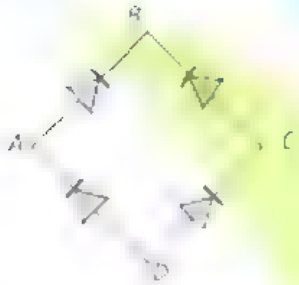
The full wave rectifier is bi-directional.

Incorrect

6/10

Q :

In the diagram, the input is across the terminals A and C and the output is across the terminals B and D, then the output is



Zero

Same as input

Full wave rectifier

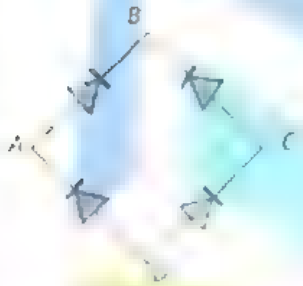
Half wave rectifier

Explanation

4 5 6 7 8 9 10

Q :

In the diagram, the input is across the terminals A and C and the output is across the terminals B and D, then the output is



A Zero

B Same as input

C Full wave rectifier

D Half wave rectifier

Explanation

The given circuit is full wave rectifier.

Incorrect

9/10

Q :

In the depletion region of an unbiased P-N junction diode there are

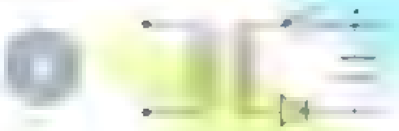
- Only electrons
- Only holes
- Both electrons and holes
- Only fixed ions

Incorrect

10/10

Q :

Which is the correct diagram of a half-wave rectifier



Q : Louise de-Broglie wavelength of a particle can be expressed by:

A $\lambda = \frac{P}{h}$

B $\lambda = \frac{h}{P}$

C $\lambda = \frac{h}{mc}$

D none of these

Q : According to Heisenberg's principle, the product of uncertainty Δx in the position of particle at some instant and the uncertainty ΔP in the x component of momentum at the same instant approximately equal to

a) Boltzman's constant

b) Plank's constant

c) Davisson and Germen principle

d) Uncertainty principle

Q :

Uncertainty in position of electron will be minimum for light of_____wavelength

- larger
- smaller
- intermediate
- infinite

Q : To decrease uncertainty in the measurement of position and momentum of a particle

	Position	Momentum
(a)	Decrease λ	Increase λ
(b)	Increase λ	Decrease λ
(c)	Decrease λ	Decrease λ
(d)	Increase λ	Increase λ

Decrease λ Increase λ

Increase λ Decrease λ

Decrease λ Decrease λ

Increase λ Increase λ

Q : In order to reduce the uncertainity in momentum, light of _____ wavelength is used

- smaller
- larger
- intermediate
- infinite

6/10 7 min Hint

Q : An electron placed in a box about size of an atom that is about 1×10^{-10}m. The lift-time of an electron in an excited state about 10^{-8}sec. What is the uncertainty in momentum and energy this time?

	U.C in momentum	U.C in energy
(a)	6.63 Js	6.63 J
(b)	6.63×10^{-24}Js	6.63×10^{-26}J
(c)	6.63×10^{-19}Js	6.63×10^{-34}J
(d)	6.63×10^{-20}Js	6.63×10^{-10}J

6.63 Js 6.63 J

6.63×10^{-24}Js 6.63×10^{-26}J

6.63×10^{-19}Js 6.63×10^{-34}J

6.63×10^{-20}Js 6.63×10^{-10}J

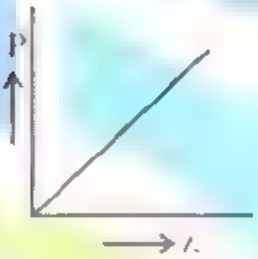
Q : According to De-Broglie, an electron can be regarded as:

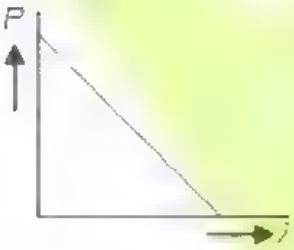
- particle only
- are negligible
- particle and wave both
- none of these

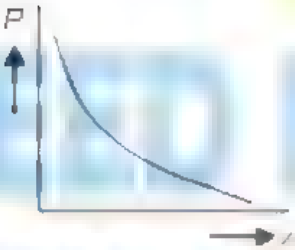
Q : The form of uncertainty principle which relates the energy of a particle and the time at which it had the energy is given by·

- $\Delta_{E.h} = \Delta t$
- $\Delta E . \Delta t = 2h$
- $\Delta E . \Delta P = h$
- $\Delta E . \Delta t = h$

Q : Which of the following graphs represent the variation of particle momentum and the associated de-Broglie wavelength?







None

Q : If an electron and a photon propagate in the form of waves having the same wavelength, it implies that they have the same

- velocity
- energy
- angular momentum
- Momentum

QUIZ RESULT

Practice test 5 Unit 10

0/10

0%

Q : Louise de-Broglie wavelength of a particle can be expressed by:

- $\lambda = \frac{P}{h}$
- $\lambda = \frac{h}{P}$
- $\lambda = \frac{h}{mc}$
- none of these

Explanation

$E = mc^2$

$hf = mc \cdot c$

$hf = Pc$

$\frac{hc}{\lambda} = Pc$

$\lambda = \frac{h}{P}$

Correct

Unattempted

Incorrect

2/10

Q : According to Heisenberg's principle, the product of uncertainty Δx in the position of particle at some instant and the uncertainty ΔP in the x component of momentum at the same instant approximately equal to

Boltzman's constant

Plank's constant

Davisson and Germen principle

Uncertainty principle

Explanation

$\Delta x . \Delta P = h$

Incorrect

3/10

Q :

Uncertainty in position of electron will be minimum for light of_____wavelength

larger

smaller

intermediate

infinite

Explanation

$\Delta x \sim \lambda$

Q : To decrease uncertainty in the measurement of position and momentum of a particle

	Position	Momentum
(a)	Decrease λ	Increase λ
(b)	Increase λ	Decrease λ
(c)	Decrease λ	Decrease λ
(d)	Increase λ	Increase λ

●	Decrease λ	Increase λ
○	Increase λ	Decrease λ
○	Decrease λ	Decrease λ
○	Increase λ	Increase λ

Explanation

To reduce uncertainty in position we need photon of shorter wavelength and to reduce

Uncertainty in momentum we need photon of longer wavelength

Incorrect

5/10

Q : In order to reduce the uncertainity in momentum, light of _____ wavelength is used

smaller

larger

intermediate

infinite

Explanation

$$\Delta P \approx \frac{h}{\lambda}$$

Correct | Unattempted

Incorrect | 6/10

Q : An electron placed in a box about size of an atom that is about 1×10^{-10}m. The lift time of an electron in an excited state about 10^{-8}sec. What is the uncertainty in momentum and energy this time?

	U.C in momentum	U.C in energy
(a)	6.63 Js	6.63 J
(b)	$6\ 63\times10^{-24}$Js	6.63×10^{-26}J
(c)	6.63×10^{-19}Js	6.63×10^{-34}J
(d)	6.63×10^{-20}Js	6.63×10^{-10}J

6.63 Js 6.63 J

6.63×10^{-24}Js 6.63×10^{-26}J

6.63×10^{-19}Js 6.63×10^{-34}J

6.63×10^{-20}Js 6.63×10^{-10}J

Explanation

A 6.63 Js 6.63 J

B 6.63×10^{-24}Js 6.63×10^{-26}J

C 6.63×10^{-19}Js 6.63×10^{-34}J

D 6.63×10^{-20}Js 6.63×10^{-10}J

Explanation

$$\Delta x.\Delta P \approx h$$

$$\Delta P \approx \frac{h}{\Delta x}$$

$$\Delta P \approx \frac{6.63\times10^{-34}}{1\times10^{-10}}$$

$$\Delta P \approx 6.63\times10^{-24}Js$$

$$\Delta E.\Delta t \approx h$$

$$\Delta E \approx \frac{h}{\Delta t}$$

$$\Delta E \approx \frac{6.63\times10^{-34}}{10^{-8}}$$

$$\Delta E \approx 6.63\times10^{-26}J$$

Correct Unattempted

Incorrect Q 7/10

Q : According to De-Broglie, an electron can be regarded as:

A particle only

B are negligible

C particle and wave both

D none of these

Explanation

$$\lambda = \frac{h}{p}$$

De-Broglie assumed that electron can be regarded a s particle and as a wel. Davisson and Germer proved the wave nature of electron.

Correct Unattempted

Incorrect Q 8/10

Q : The form of uncertainty principle which relates the energy of a particle and the time at which it had the energy is given by:

A $\Delta_{E.h} \approx \Delta t$

B $\Delta E . \Delta t \approx 2h$

C $\Delta E . \Delta P \approx h$

D $\Delta E . \Delta t \approx h$

Explanation

In terms of energy and time

$\Delta E . \Delta t \approx h$

Correct Unattempted

Incorrect Q 10/10

Q : If an electron and a photon propagate in the form of waves having the same wavelength, it implies that they have the same

A velocity

B energy

C angular momentum

D Momentum

Explanation

If an electron and a photon propagates in the form of waves having the same wavelength, it implies that they have same momentum. This is according to de-Broglie equation, $p \propto 1/\lambda$